FRITO LAY (DAR SITE ID #31)

Address:	202-218 Morgan Avenue, Brooklyn, New York 11237
Tax Lot Parcel(s):	Brooklyn Block # 2942, Lot #s 105, 112, and 111
Latitude:	40.711662° N
Longitude:	73.933028° W
Regulatory Programs/ Numbers/Codes:	NYSDEC No. C224133, PBS 2-600093, NYSDEC Spill No. 0700119
Analytical Data Status:	☐ Electronic Data Available ☒ Hardcopies only ☐ No Data Available

1 SUMMARY OF CONSTITUENTS OF POTENTIAL CONCERN (COPCs) TRANSPORT PATHWAYS TO THE CREEK

The current understanding of the transport mechanisms of contaminants from the upland portions of the Frito Lay site (site) to Newtown Creek is summarized in this section and Table 1.

Overland Transport

No specific evidence of overland transport was identified in the available site records. No stormwater infrastructure was identified on available site drawings or aerial photos. Based on the site topography, some stormwater at the site is expected to infiltrate into the ground or flow overland towards Newtown Creek (see Figure 1). Polychlorinated biphenyl (PCB) and metals contamination have been found on the upland and in adjacent creek sediment. This is a potentially complete historical and current pathway.

Bank Erosion

No specific evidence of bank erosion was identified in the available site records. Soil and groundwater contamination has been identified in several areas on the site (EDR 2010). An aerial photograph shows a sheetpile structure at the base of a slope along the creekside perimeter of the property (see Figure 1). This sheetpile wall is part of a bulkhead that has been in existence since at least 1966 (USACE 1965). PCB and metals contamination have been found on the upland and in adjacent creek sediment but no bank-specific investigation

results were found. There is insufficient evidence to make a historical or current pathway determination.

Groundwater

Based upon Phase I and Phase II Environmental Site Assessments reported in 2007 and 2008 and the Remedial Investigation (RI) reported in 2010, metals and volatile organic compounds (VOCs) were measured in concentrations greater than Class GA groundwater standards (NYSDEC 1991). Groundwater at the site generally flows to the southeast towards English Kills (EDR 2010). Groundwater is a complete historical and current pathway.

Overwater Activities

Reviewed information did not specify current overwater activities. Historically, barges containing scrap metal were loaded and offloaded along the bulkhead. There is insufficient evidence to make a current or historical pathway determination.

Stormwater/Wastewater Systems

No site-specific stormwater infrastructure was identified on available site drawings or aerial photos. Additional information is required to determine drainage patterns and to evaluate on-site stormwater and wastewater infrastructure. Based on the site topography and the site's proximity to English Kills, stormwater at the site is expected to infiltrate into the ground or flow overland towards English Kills (see Figure 1).

The site is within the Newtown Creek Water Pollution Control Plant (WPCP) sewershed (NYCDEP 2007). Discharges from the site flow to both a combined municipal sewer system and directly to English Kills via Outfall ID DA-ST-36. When the combined flows exceed the system's capacity, untreated combined sewer overflows (CSOs) are discharged to Newtown Creek. Discharge to the sewer/CSO and direct discharge of stormwater and wastewater are potentially complete current and historical pathways.

Air Releases

Newtown Metal Corporation (U.S. Environmental Protection Agency [USEPA] Facility ID No. 3604701029) was registered in the Federal Air Discharge database and was classified as having potential uncontrolled emissions less than 100 tons per year. Newtown Metal

Corporation was cited for a violation regarding compliance of nitrogen dioxide. Chlorofluorocarbons (CFCs) and VOCs were documented at the site (Gannett Fleming Engineers 2007a). There is insufficient evidence to make a current or historical pathway determination.

2 PROJECT STATUS

Frito Lay's application for the site to be submitted into New York State Department of Environmental Conservation's (NYSDEC's) Brownfield Cleanup Program was accepted in January 2009. An RI has been completed and a Remedial Work Plan is being developed (Gannett Fleming Engineers 2011). A summary of investigation and remedial activities at the site is provided in the following table:

Activity		Date(s)/Comments
Phase 1 Preliminary Site Assessment	☒	March 2007
Phase 2 Environmental Assessment	☒	March 2008
Site Characterization	☐	
Remedial Investigation	☒	July and December 2010
Remedy Selection	☐	
Remedial Design/Remedial Action Implementation	☐	
Use Restrictions (Environmental Easements or Institutional Controls)	☐	
Construction Completion	☐	
Site Closeout/No Further Action Determination	☐	

3 SITE OWNERSHIP HISTORY

Respondent Member: ☐ Yes ☒ No

Owner	Years	Occupant	Types of Operations
Luria Brothers and Company, Inc.	ca. 1907	Warren Manufacturing Company	Bagging and old rope storage
	ca. 1907	American Building Supply Company	Lime and cement shed
	ca. 1907 – 1930s?	Empire Brick and Supply Company	Lime and cement shed & offices
	ca. 1951 – 1983	Lipsett Steel (Division of Luria Brothers)	Scrap metal processing facility
Newtown Steel, Inc.	1983 – 1989	Newtown Steel, Inc.	Scrap metal processing facility
Gloria Development Corp.	1989 – 2006	Newtown Metal Company	Scrap metal processing facility
Rolling Frito-Lay Sales, LP	2006 – Present	Vacant lot	

Notes:
ca. – circa

4 PROPERTY DESCRIPTION

The property occupies approximately 2.8 acres adjacent to English Kills. The site slopes gently down from approximately 13 feet above mean sea level in the western portion of the property to about 10 feet mean sea level along southeastern and northeastern boundaries with English Kills before it descends steeply to the water.

Morgan Avenue is located along the southwestern property boundary. One environmentally regulated site, Morgan Oil Terminal, is located adjacent to the site along the southern border (see Figure 1). A Frito Lay distribution center is located adjacent to the site to the northwest. The area is zoned for manufacturing and is designated M3-1 (NYCDCP 2011). A 2010 aerial photograph of the site is presented as Figure 1.

5 CURRENT SITE USE

Currently, the site is vacant with no standing structures (EDR 2010).

6 SITE USE HISTORY

The property is located adjacent to English Kills on a basin with a pier (New York City Department of Finance [NYCDOF] 2012). In the 19th and early 20th centuries, English Kills was a wide and winding creek. Originally, the shore of English Kills curved into the property. The U.S. Army Corps of Engineers (USACE) assigned new harbor lines in 1915, resulting in the straight-channeled English Kills of today (War Department 1922).

In the early 1900s, the American Building Supply Company owned a lime and cement shed along with offices on the property at the end of the inlet/basin. Another brick and cement company, Empire Brick and Cement Company, had a lime and cement shed and offices north of the inlet/basin located on the property. A portion of the Warren Manufacturing Company's storage building was also located northwest of the Empire building on the property (Sanborn 1908).

By 1933 the Empire Brick and Supply Company had established itself over the entire site. The company stored building materials along the basin and housed them in a building with truck storage. A crane shed sat closer to English Kills and the basin (Sanborn 1933).

The Lipsett Steel scrap metal processing facility existed on the site beginning in 1951 (Claster 2000). Lipsett shipped and occasionally received scrap metal by barge. The bulkhead was made of part timber and part steel pile with solid fill. Lipsett had four diesel cranes with buckets and electronic magnets and eight diesel crawler cranes used in the rear yard. The site had an open storage area for up to 24,000 tons of scrap metal (USACE 1965a).

In 2003, the property contained several small buildings and was operated by the Newtown Metal Company (URS 2003).

Rolling Frito-Lay Sales, LP, is the current owner of the site.

7 CURRENT AND HISTORICAL AREAS OF CONCERN AND COPCs

The current understanding of the historical and current potential upland and overwater areas of concern at the site is summarized in Table 1. The following sections provide brief discussion of the potential sources and COPCs at the site requiring additional discussion.

Areas of concern at the site include areas in which scrap metal was processed, residual contamination from scrap metal processing, the lime and cement shed, building materials storage areas, and bagging and rope storage areas. COPCs associated with these sources include VOCs, semi-volatile organic compounds (SVOCs), PCBs, and metals (Gannett Fleming Engineers 2007a, 2007b, and 2008).

7.1 Uplands

Since the 1950s, the site was used as a scrap metal processing facility. Upland areas of concern would have included historical metal storage and processing areas and storage areas for fuels/chemicals used on the property.

During a site investigation in 2003, several drums were observed and were reported as a potential on-site VOC source area (Gannett Fleming Engineers 2007a). During the Phase I site assessment, mounds of debris were observed and remnants of the previous usage of the property as a scrap metal yard were observed. Asbestos containing material and lead-based paint was suspected within the debris piles and on-site structures (Gannett Fleming Engineers 2007a). Subsequent analyses conducted in 2007 confirmed that roof shingles on the buildings and material covering the wood shed contained asbestos (Gannett Fleming Engineers 2008). Paint chip samples contained less than the USEPA's required 0.5 percent by weight lead content and, therefore, were not considered lead-based paint (Gannett Fleming Engineers 2008).

Two underground storage tanks (USTs) used for storing No. 2 fuel oil were listed under Petroleum Bulk Storage (PSB) No. 2-600093 (NYSDEC 2012). The 3,000-gallon UST (Tank No. 001) was installed in December 1948 and the 550-gallon UST (Tank No. 002) was installed December 1973. Both USTs were closed and removed on April 1, 1991.

7.2 Overwater Activities

Overwater activities are not a current transport pathway. The site is adjacent to English Kills and a slip from English Kills borders the southeast portion of the property. The slip serves Pier 400, which is located along the southeastern portion of the property (NYCDCP 2007). Material reviewed for this summary indicated that barges were loaded and unloaded with scrap metal at times but not enough information is available describing historical overwater activities occurring at the site.

7.3 Spills

Documented spills at the site are summarized as follows:

- On April 4, 2007, an abandoned drum of waste oil/used oil was reported on a sidewalk. NYSDEC Spill No. 0700119 listed unknown amount spilled to soil from this drum. The spill case was closed on May 23, 2007.

8 PHYSICAL SITE SETTING

8.1 Geology

According to maps and reports published by the U.S. Geological Survey (USGS) and others, the site is underlain by unconsolidated Cretaceous to Quaternary age sand and gravel deposits that comprise Long Island's groundwater system. These hydrogeologic units consist of alternating interbedded lenses of gravel, sand, silt, and clay, which form a layered sequence of aquifers and confining units that dip gently to the south and east. Based on USGS data, underlying soil at the site consists of well graded fine to coarse grained sand with gravel (SW) or poorly graded fine to coarse grained sand with gravel (SP) as defined by the Unified Soil Classification System (USCS; Gannett Fleming Engineers 2007a).

Surface soils consist of many metal pieces, wire, rubber, glass, plastic, ceramics, brick, concrete, wood pieces, and other various types of fill material. These fill materials found in the soils extend to the groundwater interface. The subsurface fill materials consist mostly of concrete, wood, bricks, and rubbish (including metals, plastic, and glass). Peat, organic matter, and other soils (gray sand and black silt) were found near the surface in borings near

the English Kills. Near Morgan Avenue, pockets of coal ash and coal spoils were observed in the fill (Gannett Fleming Engineers 2010).

8.2 Hydrogeology

Depth to groundwater at the site is approximately 11 to 15 feet below ground surface (bgs; Gannett Fleming Engineers 2010). Groundwater elevation contour data shows that the regional inferred groundwater flow direction is to the east towards the English Kills with on-site flow radiating from northeast to southeast across the site towards the English Kills (Gannett Fleming Engineers 2007a). The Phase I site assessment reported that the slip along the south of the property serves as a hydrologic barrier between the site and property the south (Morgan Oil – DAR Site ID 60), preventing groundwater contamination from Morgan Oil traveling to the site (Gannett Fleming Engineers 2007a).

9 NATURE AND EXTENT (CURRENT UNDERSTANDING OF ENVIRONMENTAL CONDITIONS)

9.1 Soil

Soil Investigations	☒ Yes ☐ No
Bank Samples	☐ Yes ☒ No ☐ Not Applicable
Soil-Vapor Investigations	☒ Yes ☐ No

9.1.1 Soil Investigations

In October 2003, eight subsurface soil samples and five surface soil samples were collected as part of an investigation prior to the potential purchase of the property by Steel Quattro, LLC (Gannett Fleming Engineers 2007a). Results of this investigation showed SVOC and metals, including elevated lead and mercury concentrations, prevalent throughout the property. PCB contamination was found in the surface soils throughout the site and in subsurface soils east of a then-existing building. Elevated VOCs, including chlorinated compounds, were found in surface and subsurface soils (Gannett Fleming Engineers 2007a).

Surface soil samples (0 to 6 inches below grade) were collected in February 2007 during the Surface Pile Characterization Study conducted in support of the Phase II Environmental Site

Assessment (Gannett Fleming Engineers 2007b). The locations of surface soil samples are shown as Attachment 1 (Gannett Fleming Engineers 2007b). The majority of the VOC/SVOC detections and exceedances found in the surface soils were from one location while PCBs and inorganics were detected in samples across the site. The following table presents a summary of the analytical results for contaminants exceeding Recommended Soil Cleanup Objectives (RSCOs) or Brownfields Cleanup Objectives (BCOs) of surface soil samples from that study:

Compound	Units	Minimum Concentration	Maximum Concentration
Acetone	µg/kg	<24	180 JB
cis-1,2-Dichloroethene	µg/kg	<2.0	260
Tetrachloroethene	µg/kg	<5.0	11,000 D
Trichloroethene	µg/kg	<1.9	470
Vinyl Chloride	µg/kg	<5.1	23 J
Benzo(a)anthracene	µg/kg	<1,300	16,000
Benzo(a)pyrene	µg/kg	<1,400	21,000
Benzo(b)fluoranthene	µg/kg	<1,000	12,000
Benzo(g,h,i)perylene	µg/kg	<1,500	51,000
Benzo(k)fluoranthene	µg/kg	<2,000	4,000 J
bis(2-Ethylhexyl)phthalate	µg/kg	<1,700	140,000
Butylbenzylphthalate	µg/kg	1,600J	87,000 JD
Chrysene	µg/kg	<1,600	15,000
Dibenz(a,h)anthracene	µg/kg	<1,100	5,200 J
Dibenzofuran	µg/kg	<1,500	9,000 J
Indeno(1,2,3-cd)pyrene	µg/kg	<1,100	18,000
Naphthalene	µg/kg	<1,500	16,000
Phenanthrene	µg/kg	<1,500	74,000 D
Aroclor 1248		8,200P	75,000 P
Aroclor 1260		<270	7,400 P
Arsenic		9.36	52.6
Barium		658	1,840
Cadmium		3.75	82
Chromium		47.6	798
Lead		1,400	9,790
Mercury		1.4	11.1
Selenium		<0.261	56.2
Silver		0.851	12.9

Notes:
µg/kg – microgram per kilogram
< – Analyte not detected at indicated concentration.

B – Analyte found in laboratory blank. Possible laboratory contamination.
D – Qualifier not defined in report.
J – Result is less than the quantitation limit, but greater than zero. Concentration is approximated.
P – Percent difference between quantitated concentrations for dual column analysis greater than 40%.

In December 2007, 15 soil borings were advanced to approximately 9 to 13 feet below ground surface. The locations of the borings are illustrated in Attachment 2 (Gannett Fleming Engineers 2008). VOC concentrations in the soil exceeded NYSDEC RSCOs and BCOs for Unrestricted Use and Restricted Use for the Protection of Groundwater throughout the site with the highest concentrations located at the center of the site (Stations SB-6, SB-8, SB-9, and SB-11). VOC concentrations did not exceed BCOs for Restricted Use-Commercial in the soil samples (Gannett Fleming Engineers 2008). SVOC concentrations in the soil exceeded NYSDEC RSCOs and BCOs for Unrestricted Use, Restricted Use for the Protection of Groundwater, and Restricted Use-Commercial throughout the site, having the highest concentrations in the center and northeast corner of the property (Gannett Fleming Engineers 2008). Total PCB concentrations in soil exceeded NYSDEC RSCOs and BCOs for Unrestricted Use, Restricted Use for the Protection of Groundwater and Restricted Use-Commercial throughout the site with the highest concentration reported in the samples collected from 9 to 11 feet below grade (Gannett Fleming Engineers 2008). Soil metals concentrations exceeded NYSDEC RSCOs and BCOs for Unrestricted Use, Restricted Use for the Protection of Groundwater, and Restricted Use-Commercial throughout the site. Arsenic, barium, cadmium, chromium, lead, mercury, and nickel each exceeded Brownfields criteria for Commercial Use. The highest concentrations were reported from the soil samples obtained at the center of the site (SB-8, SB-9, and SB-11). Soils from 0 to 5 feet below grade were reported with the highest metals impacts (Gannett Fleming Engineers 2008). The maximum soil contaminant concentrations measured during the Phase II for analytes exceeding RSCOs or BCOs are summarized in the following table:

Analyte	Units	Minimum Soil Concentration	Maximum Soil Concentration
VOCs			
1,2,4-Trimethylbenzene	µg/kg	<2.1	4,800 D
1,2-Dichlorobenzene	µg/kg	<2.1	4,700 D
2-Butanone	µg/kg	<16	310
Acetone	µg/kg	<19	1,900

Analyte	Units	Minimum Soil Concentration	Maximum Soil Concentration
Benzene	µg/kg	<2.2	150
cis-1,2-Dichloroethene	µg/kg	<1.8	15,000 D
Ethyl Benzene	µg/kg	<2	2,200 D
Methylene Chloride	µg/kg	<10	130 B
m/p-Xylenes	µg/kg	<4.8	1,700
o-Xylene	µg/kg	<2.1	1,100
Tetrachloroethene	µg/kg	<4.1	150,000 D
Trichloroethene	µg/kg	<1.7	2,300 D
Vinyl Chloride	µg/kg	<4.6	2,100 D
SVOCs			
2-Methylnaphthalene	µg/kg	<11	43,000
2-Methylphenol	µg/kg	<9.9	110 J
3+4-Methylphenols	µg/kg	<11	420 J
Acenaphthene	µg/kg	<8.5	34,000
Anthracene	µg/kg	<15	58,000
Benzo(a)anthracene	µg/kg	<11	100,000 D
Benzo(a)pyrene	µg/kg	<13	75,000
Benzo(b)fluoranthene	µg/kg	<33	110,000 D
Benzo(k)fluoranthene	µg/kg	<21	33,000
bis(2-Ethylhexyl)phthalate	µg/kg	<16	110,000 D
Butylbenzylphthalate	µg/kg	<23	96,000 D
Chrysene	µg/kg	<8.4	97,000 D
Dibenz(a,h)anthracene	µg/kg	<29	3,700 J
Dibenzofuran	µg/kg	<12	23,000
Di-n-butylphthalate	µg/kg	<17	8,700
Fluoranthene	µg/kg	53J	240,000 D
Fluorene	µg/kg	<11	42,000
Indeno(1,2,3-cd)pyrene	µg/kg	<11	37,000
Naphthalene	µg/kg	<9.5	57,000
Phenanthrene	µg/kg	47J	240,000 D
Phenol	µg/kg	<10	3,100 J
Pyrene	µg/kg	48J	200,000 D
PCBs			
Aroclor-1242	µg/kg	<5.9	73,000 D
Aroclor-1248	µg/kg	<2.9	22,000 D

Analyte	Units	Minimum Soil Concentration	Maximum Soil Concentration
Aroclor-1254	µg/kg	<1.9	33,000 D
Aroclor-1260	µg/kg	<4.7	1,600 D
Total Metals			
Arsenic	mg/kg	1.50	168
Barium	mg/kg	29.8	1,590
Beryllium	mg/kg	0.044J	1.15
Cadmium	mg/kg	<0.045	45.2
Chromium	mg/kg	4.35J	454
Cobalt	mg/kg	1.23J	35 N
Copper	mg/kg	12.4	2,430
Iron	mg/kg	2,890J	178,000 J
Lead	mg/kg	26.5J	9,020
Manganese	mg/kg	30.3J	2,730
Mercury	mg/kg	0.053J	11.2 D
Nickel	mg/kg	7.76J	565 N
Selenium	mg/kg	<0.133	71.1
Silver	mg/kg	<0.133	6.4
Vanadium	mg/kg	3.32	291

Notes:
Definitions of qualifiers not provided in reviewed report.
µg/kg – microgram per kilogram
mg/kg – milligram per kilogram
PCB – polychlorinated biphenyl
SVOC – semi-volatile organic compound
VOC – volatile organic compound

Fifteen additional soil borings were advanced to the approximate depth of groundwater (11 to 15 feet below ground surface) as part of the RI conducted in November 2009 (Gannett Fleming Engineers 2010). Attachment 5 illustrates the location of these borings relative to previous station locations.

The RI identified several soil contaminants that could have the potential to migrate and impact groundwater quality at the site, including arsenic, lead, mercury, PCBs, and SVOCs, are present in surface and subsurface soils at concentrations exceeding Restricted Use – Commercial and Industrial Soil Cleanup Objectives (SCOs). SVOCs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and

indeno(1,2,3-cd)pyrene have been previously detected at concentrations exceeding Part 375 Restricted Use SCOs. The detected soil contamination is located throughout the site to depths greater than 11 feet bgs, which is the approximate depth of groundwater beneath the site (Gannett Fleming Engineers 2010).

A supplemental RI advanced an additional 27 soil borings at the site in August 2010. The soil sample results indicated that target analyte list (TAL) metal and PCB soil concentrations were present in surface and subsurface soils at concentrations exceeding the Unrestricted Use SCOs in most soil borings. Potentially hazardous levels of PCBs were not detected during the supplemental remediation investigation. Results of an arsenic toxicity characteristic leaching procedure (TCLP) analysis also did not exceed the Resource Conservation and Recovery Act (RCRA) Hazardous Waste Regulatory Level of 5 mg/L in the six samples collected for analysis (Gannett Fleming Engineers 2011).

A second supplemental RI was conducted in October 2010 and advanced another 38 soil borings at the site to further delineate PCB concentrations. The soil sample results indicated that TAL metals, notably lead, and PCB soil concentrations were present at concentrations exceeding the Unrestricted Use SCOs and arsenic concentrations were present at concentrations exceeding the Restricted Use – Protection of Groundwater SCOs in surface and subsurface soils in most soil borings (Gannett Fleming Engineers 2011).

9.1.2 Soil Vapor Investigations

As part of the subsurface soil investigation conducted in December 2007, three samples per boring (shallow, mid, and deep [i.e., just above the groundwater interface]) were screened for soil vapor using a photoionization detector (PID) calibrated to 100 parts per million (ppm) for isobutylene. The PID readings ranged from 0.0 to greater than 100 ppm in the shallow sample located at SB-11 (Gannett Fleming Engineers 2008).

Attempts to advance borings to collect soil vapor samples in December 2007 failed due to the encountering of refusal prior to reaching within 1 foot of the groundwater (Gannett Fleming Engineers 2008).

Soil borings advanced during the November 2009 RI were screened using a PID calibrated to 100 ppm isobutylene standard. The PID readings ranged from 0.0 to 100 ppm in the 4- to 6-foot depth interval at SB-26 (Gannett Fleming Engineers 2010).

Three soil vapor collection points were advance to a depth of 11 feet bgs in November 2009 during the RI. Analytical chemistry results showed subsurface soil vapor concentrations ranging from 1,162.4 to 15,824.9 μg/m^3 of total VOCs.

9.1.3 Soil Summary

Throughout the site, VOCs, SVOCs, PCBs, and metals were detected in concentrations greater than soil cleanup objectives. The detected soil contamination is located throughout the site to depths of 11 feet bgs or greater, which is the approximate depth of groundwater beneath the site. Soil vapor investigations have demonstrated the presence of subsurface vapor through PID readings and analytical results.

9.2 Groundwater

Groundwater Investigations	☒ Yes ☐ No
NAPL Presence (Historical and Current)	☐ Yes ☒ No
Dissolved COPC Plumes	☒ Yes ☐ No
Visual Seep Sample Data	☐ Yes ☒ No ☐ Not Applicable

9.2.1 Groundwater Investigations

During the investigation conducted in October 2003, four groundwater samples were collected from on-site monitoring wells (Gannett Fleming Engineers 2007a). Significant lead and mercury concentrations were reported in the groundwater throughout the site, with the greatest metals concentrations detected near the eastern edge of the site adjacent to English Kills. Significant VOC concentrations were also found in groundwater on a portion of the site (Gannett Fleming Engineers 2007a).

Groundwater monitoring was conducted as part of the Phase II Environmental Assessments reported in 2008. In December 2007, five monitoring wells were installed to a depth of approximately 10 feet below the depth of the static water table. The locations of the

monitoring wells are included in Attachment 3 (Gannett Fleming Engineers 2008). Monitoring wells were gauged in December 2007 and January 2008. The depth to groundwater ranged from 11.9 to 15.1 feet bgs. Attachment 4 illustrates groundwater contour maps developed from the surveys (Gannett Fleming Engineers 2008).
Vinyl chloride, cis-1,2-dichloroethane, and methyl tert-butyl ether (MTBE) were the only VOCs to be measured in one or more groundwater samples greater than the NYSDEC groundwater guidance values. SVOCs in groundwater samples were measured below the NYSDEC groundwater guidance values. Aluminum, antimony, iron, lead, magnesium, manganese, sodium, and thallium were measured at concentrations greater than the NYSDEC groundwater guidance values in one or more groundwater samples. Other metals were reported below guidance values (Gannett Fleming Engineers 2008). One additional groundwater monitoring well was installed in November 2009 during the RI (Gannett Fleming Engineers 2010), and samples were collected from the six on-site monitoring wells. The following table lists the maximum concentrations observed during either the Phase II Environment Assessment or the RI for contaminants exceeding NYSDEC guidance values:

Analyte	Units	Minimum Groundwater Concentration	Maximum Groundwater Concentration
VOCs			
1,1-Dichloroethane	µg/L	1 J	6.4
1,2-Dichloroethane	µg/L	<5	1.4 J
Benzene	µg/L	0.5J	12
Cis,1-2,dichloroethene	µg/L	<0.48	46
MTBE	µg/L	<0.22	63
Vinyl chloride	µg/L	<0.62	42
Metals			
Aluminum	mg/L	0.0344 J	71.1
Antimony	mg/L	<0.0081	0.0166
Arsenic	mg/L	0.00645 J	0.0746
Cobalt	mg/L	0.00845 J	0.0514
Copper	mg/L	0.0028 J	0.227
Iron	mg/L	0.0523	122
Lead	mg/L	<0.0022	0.743
Magnesium	mg/L	0.559J	70.3
Manganese	mg/L	<0.0013	2.44

Analyte	Units	Minimum Groundwater Concentration	Maximum Groundwater Concentration
Mercury	mg/L	<0.00009	0.00281 J
Nickel	mg/L	0.00373 J	5.28
Selenium	mg/L	0.0096 J	0.0152
Sodium	mg/L	1.11	478
Thallium	mg/L	<0.00288 J	0.0117
Vanadium	mg/L	0.0043 J	0.179

Notes:
µg/kg – microgram per liter
< – Analyte not detected at indicated concentration.
J – Result is less than the quantitation limit, but greater than zero. Concentration is approximated.
mg/L – milligram per liter

9.2.2 Dissolved Contaminant Plume

Vinyl chloride, cis-1,2-dichloroethene and arsenic were measured in concentrations greater than Class GA groundwater standards in on-site monitoring wells (EDR 2010). Vinyl chloride was measured at a concentration of 42 ppb in monitoring well MW-2 in the southwest corner of the site. Chlorinated VOCs present in groundwater on the site may be attributable to an off-site source (Gannett Fleming Engineers 2010).

9.2.3 Groundwater Summary

Metals and VOCs were measured in concentrations greater than Class GA groundwater standards in on-site monitoring wells.

9.3 Surface Water

Surface Water Investigation	☒ Yes	☐ No
SPDES Permit (Current or Past)	☐ Yes	☒ No
Industrial Wastewater Discharge Permit (Current or Past)	☐ Yes	☒ No
Stormwater Data	☐ Yes	☒ No
Catch Basin Solids Data	☐ Yes	☒ No
Wastewater Data	☐ Yes	☒ No

9.3.1 Surface Water Investigation

Two surface water samples were collected from Newtown Creek during the November 2009 RI (Gannett Fleming Engineers 2010). The results of the RI sampling program indicated that several VOCs and SVOCs were detected, but concentrations are below the applicable NYSDEC Human Consumption of Fish – Saline Waters (HCF-SW), Fish Survival – Saline Waters (FS-SW), Wildlife Protection – Saline Waters (WP-SW), and Aesthetic Waters – Saline Waters (AW-SW) Water Quality Standards (Gannett Fleming Engineers 2010). PCBs were not detected in the surface water samples collected during the RI sampling program above applicable NYSDEC criteria. A copper concentration of 0.005 J mg/L which is above the FS-SW of 0.0048 mg/L was detected in SW-2. No other TAL metal concentrations were detected above applicable NYSDEC criteria (Gannett Fleming Engineers 2010).

9.3.2 Stormwater and Wastewater Systems

No site-specific stormwater infrastructure was identified on available site drawings or aerial photos. Based on the site topography and its location adjacent to English Kills, some stormwater at the site is expected to infiltrate into the ground or flow overland towards English Kills (see Figure 1).

Reviewed documents indicate that this site discharges stormwater to both the municipal sewer system and directly to English Kills. The site is located in Newtown Creek Water Pollution Control Plant (WPCP) sewershed. Some amount of combined stormwater and wastewater is also expected to flow into the combined municipal sewer system. When the combined flow exceeded the system's capacity untreated CSOs are discharged to Newtown Creek at Outfall 015.

9.3.3 SPDES Permit

Information reviewed in available records indicates that the site has not been issued a current or historic State Pollutant Discharge Elimination System (SPDES) permit.

9.3.4 Industrial Wastewater Discharge Permit

Information reviewed in available records indicates that the site has not been issued a current or historical Industrial Wastewater Discharge permit.

9.3.5 Surface Water Summary

Two surface water samples were collected with low-level detections of VOCs and SVOCs (no exceedances), no detection of PCBs, and one inorganic estimated detection above the FS-SW criteria.

No site-specific stormwater infrastructure was identified on available site drawings or aerial photos. Reviewed documents indicate that this site discharges stormwater both to the municipal sewer system and directly to English Kills. Some amount of combined stormwater and wastewater is also expected to flow into the combined municipal sewer system. When the combined flow exceeded, the system's capacity untreated CSOs are discharged to Newtown Creek (NYCDEP 2007).

9.4 Sediment

Creek Sediment Data ☒ Yes ☐ No ☐ Not Applicable

Four sediment surface grab samples were collected from Newtown Creek during the November 2009 Remedial Investigation (Gannett Fleming Engineers 2010). The results of the RI sampling program did not indicate the presence of VOCs, SVOCs, and pesticides at concentrations above the NYSDEC's Technical for Screening Contaminated Sediment criteria. The sampling results were also compared to NYSDEC Human Health Bioaccumulation (HHB), Benthic Aquatic Life Toxicity (BALT), Benthic Aquatic Life Chronic Toxicity (BALCT), and Wildlife Bioaccumulation (WB) Guidance Values. TAL metal concentrations exceed the Severe Effect Level (SEL) criteria at all four sediment sample locations. PCB concentrations were also detected above HHB or WB criteria at all four sediment sample locations (Gannett Fleming Engineers 2010).

9.5 Air

Air Permit	☐ Yes ☒ No
Air Data	☐ Yes ☒ No

Newtown Metal Corporation (USEPA Facility ID No. 3604701029) was registered in the Federal Air Discharge database and was classified as having potential uncontrolled emissions less than 100 tons per year. Newtown Metal Corporation was cited for a violation regarding compliance of nitrogen dioxide. CFCs and VOCs were documented at the site (Gannett Fleming Engineers 2007a).

10 REMEDIATION HISTORY (INTERIM REMEDIAL MEASURES AND OTHER CLEANUPS)

In the completed Remedial Investigation report it was recommended that select areas where soil concentrations exceed criteria be excavated and then the entire site would be covered with a 6-inch layer of asphalt and used as a parking lot for Frito Lay operations (Gannett Fleming Engineers 2010). Documentation indicates that a remedial action work plan to evaluate remedial alternatives will be prepared. Groundwater monitoring will continue once remedial activities have completed to monitor VOC concentrations, which were above Technical and Operational Guidance (TOG) standards. No permanent structures were to be constructed and an environmental easement will be drafted to contain language describing requirements to address indoor air quality should any structures be constructed in the future.

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12 ATTACHMENTS

Figures

Figure 1 Site Vicinity Map: Frito Lay

Tables

Table 1 Potential Areas of Concern and Transport Pathways Assessment

Attachments

Attachment 1 Figure 3. Surficial Soil and Debris Pile Sampling Locations (Gannett Fleming Engineers 2007b)

Attachment 2 Figure 3. Soil Boring Location Map (Gannett Fleming Engineers 2008)

Attachment 3 Figure 4. Monitoring Wells Location Map (Gannett Fleming Engineers 2008)

Attachment 4 Figures 5 thru 7. Groundwater Contour Maps for December 12 and 26, 2007, and January 18, 2008 (Gannett Fleming Engineers 2008)

Attachment 5 Figure 4-1. 2007 and 2009 Sampling Locations (Gannett Fleming Engineers 2010)

Table 1

Potential Areas of Concern and Transport Pathways Assessment – Frito Lay

Potential Areas of Concern	Media Impacted					COPCs														Potential Complete Pathway						
						TPH			VOCs																		
Description of Areas of Concern	Surface Soil	Subsurface Soil	Groundwater	Catch Basin Solids	Creek Sediment	Gasoline-Range	Diesel – Range	Heavier – Range	Petroleum Related (e.g., BTEX)	VOCs	Chlorinated VOCs	SVOCs	PAHs	Phthalates	Phenolics	Metals	PCBs	Herbicides and Pesticides	Dioxins/Furans	Overland Transport	Groundwater	Direct Discharge – Overwater	Direct Discharge – Storm/Wastewater	Discharge to Sewer/CSO	Bank Erosion	Air Releases
Scrap Metal Processing Operations	√	√	√	?	√	?	?	?	?	√	√	√	√	?	?	√	√	?	?	?	√	?	?	?	?	?

Notes:
√ – COPCs are/were present in areas of concern having a current or historical pathway that is determined to be complete or potentially complete.
? – There is not enough information to determine if COPC is/was present in area of concern or if pathway is complete.

BTEX – benzene, toluene, ethylbenzene, and xylene
COPC – constituent of potential concern
CSO – combined sewer overflow
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
SVOC – semi-volatile organic compound
TPH – total petroleum hydrocarbon
VOC – volatile organic compound

Q:\Jobs\1107782-01_NewTownCreek\Maps\RI_RemedialInvestigation\Historic_Data_Research\Site-Features.Mapbook.mxd ckiblinger 5/23/2012 4:56:22 PM

- USEPA Sample Locations (Surface and Subsurface)
- Shoreline (NYC Dept. of Information Technology, 2006)
- USGS Nat'l Elev. Dataset 5-foot Contours
- Selected Site Property Boundary
- Neighboring Site Property Boundary

Outfall Class

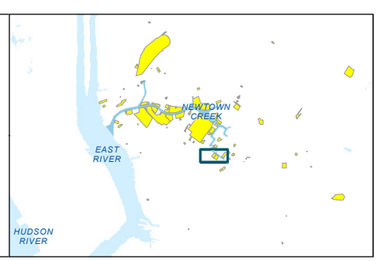
- Direct Discharge
- General
- Highway Drain
- Major Stormwater Outfall
- SPDES
- Storm Drain

NOTES:

1. Outfall Labeling: BB: Bowery Bay; NC(B/Q): Newtown Creek, Brooklyn/Queens; ST: Stormwater.
2. Outfall locations are preliminary, compiled, estimated data based on New York City Department of Environmental Protection (NYCDEP) maps and tabulated data and other resources. Many outfall locations were taken from the New York City Shoreline Survey Program: Newtown Creek Water Pollution Control Plant Drainage Area, NYCDEP, March 31, 2003. Other locations were taken from an excerpt from a similar report from 2008 (the complete report was not included in files available for review). Finally, some outfall locations were inherited from previous Anchor QEA and Newtown Creek Project work. Latitudinal and longitudinal data provided in the 2003 and 2008 NYCDEP reports were rounded to the nearest second. This resulted in potential outfall location discrepancies of up to approximately 200 feet. All outfall locations are currently under field verification.
3. Aerial Photos: New York State Division of Homeland Security and Emergency Services, 2010.
4. Site Boundaries are based on New York City parcels data.
5. Coarse topographic contours are derived from U.S. Geological Survey 10-meter data.

Feet

0 100 200 300 400



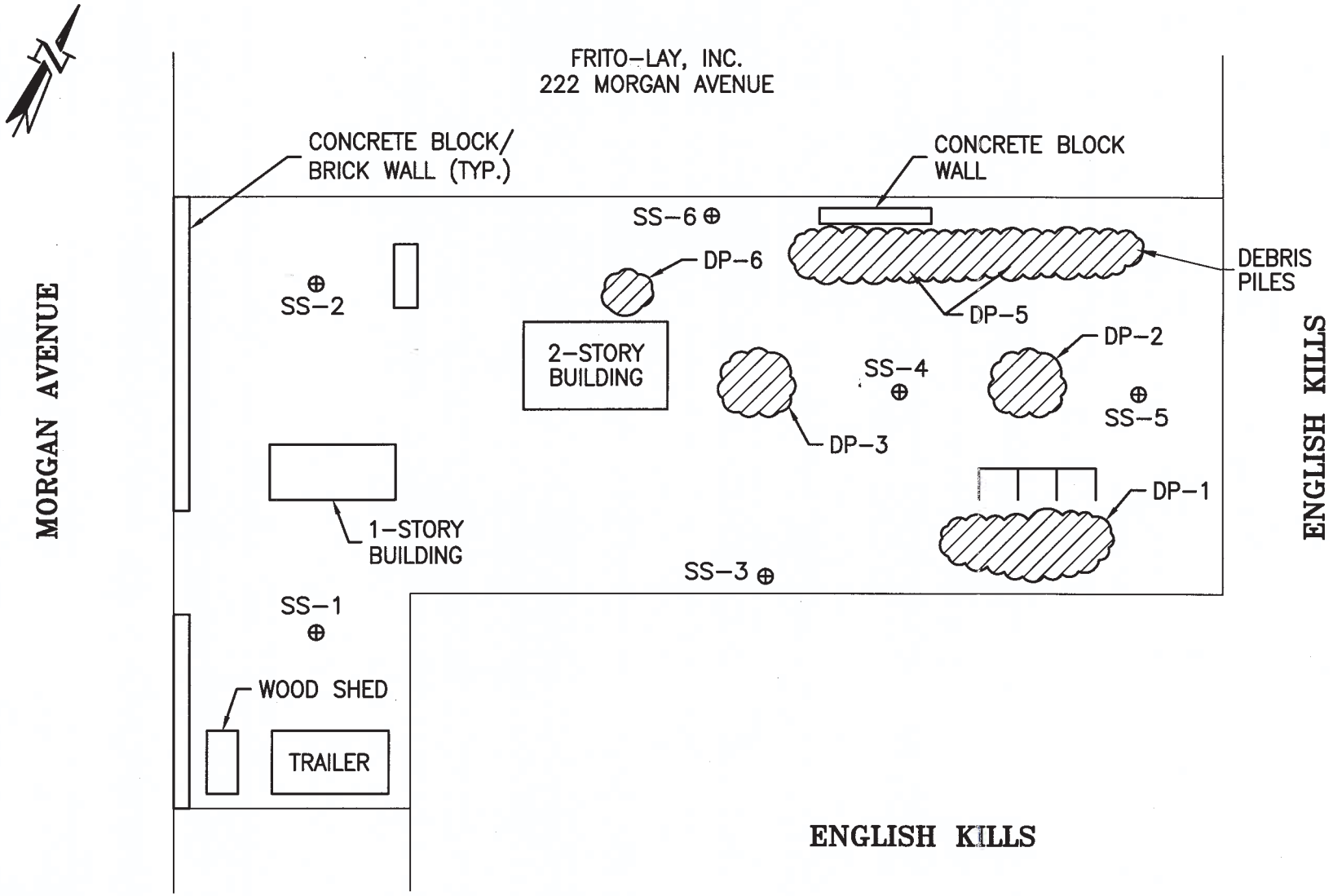
ANCHOR QEA

DRAFT

Figure 1
Site Vicinty Map
Draft Upland Site Summary: Frito Lay
Newtown Creek RI/FS

SUPPLEMENTAL ATTACHMENTS

Attachment 1



LEGEND:

⊕ SURFICIAL SOIL SAMPLE LOCATION

DEBRIS PILE SAMPLE LOCATION

NOT TO SCALE

SURFICIAL SOIL AND DEBRIS PILE SAMPLING LOCATIONS

FRITO-LAY, INC.

202-218 MORGAN AVENUE, BROOKLYN, NEW YORK

Gannett Fleming

FIGURE 3

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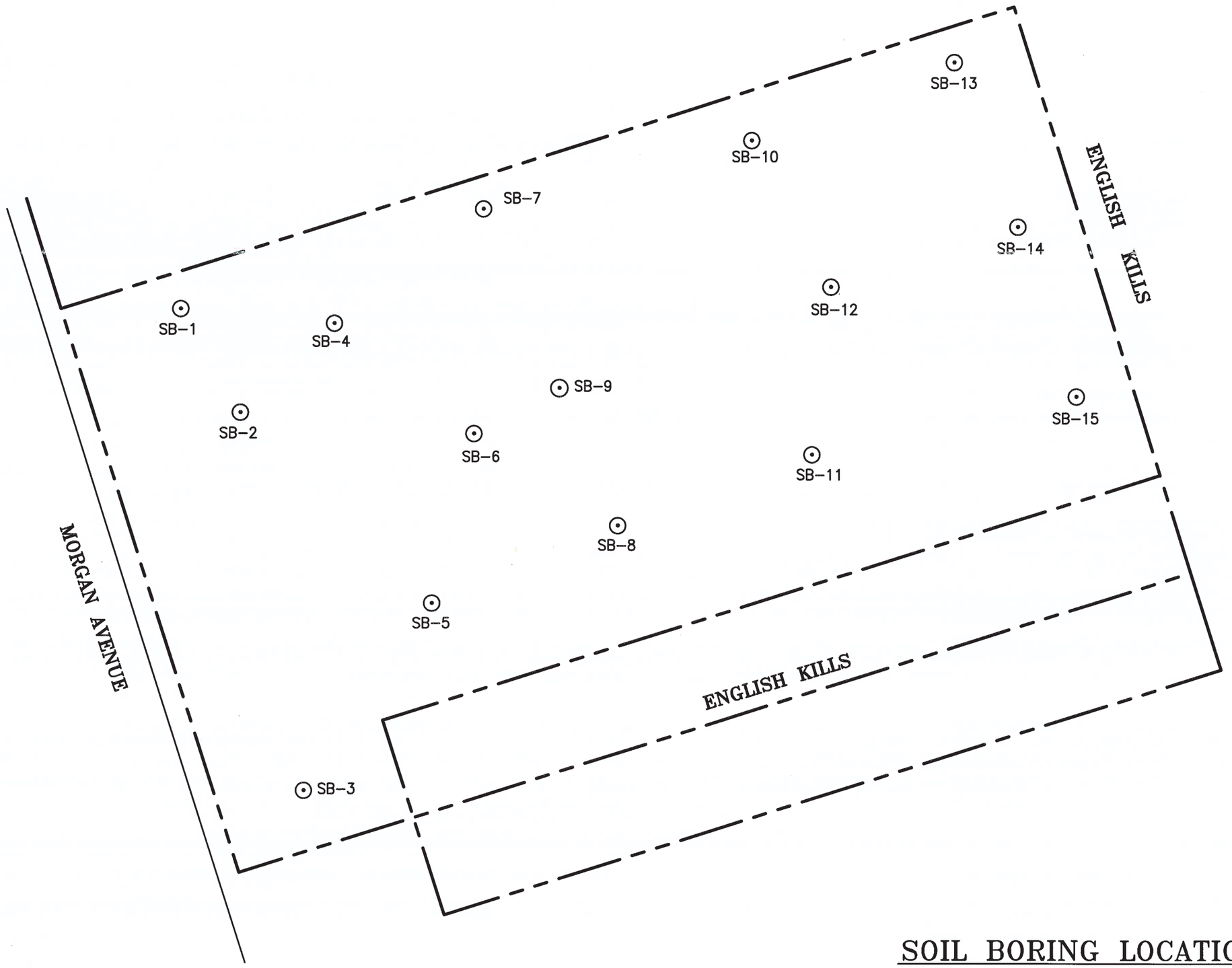
Attachment 2

Gannett Fleming

FIGURE 3



0 50'

Scale In Feet

SOIL BORING LOCATION MAP

FRITO LAY

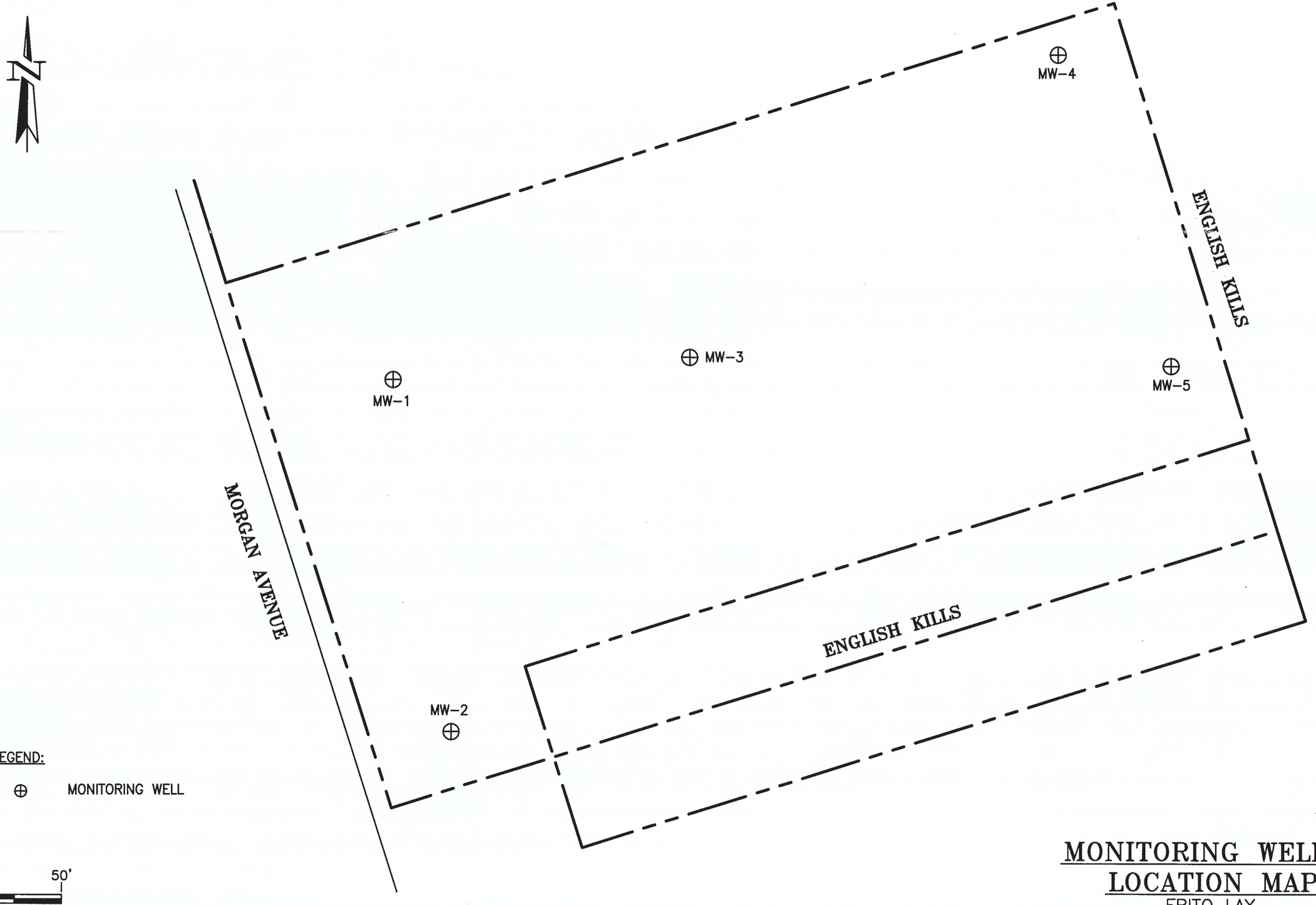
202–218 MORGAN AVENUE, BROOKLYN, NEW YORK

03/25/08 4:26pm FILE= K:\PROJECTS\47000's\47743\007\SITE BASE.DWG by MDOHERTY XREFs=SITE PLAN,

Attachment 3

Gannett Fleming

FIGURE 4



MONITORING WELLS LOCATION MAP

FRITO LAY

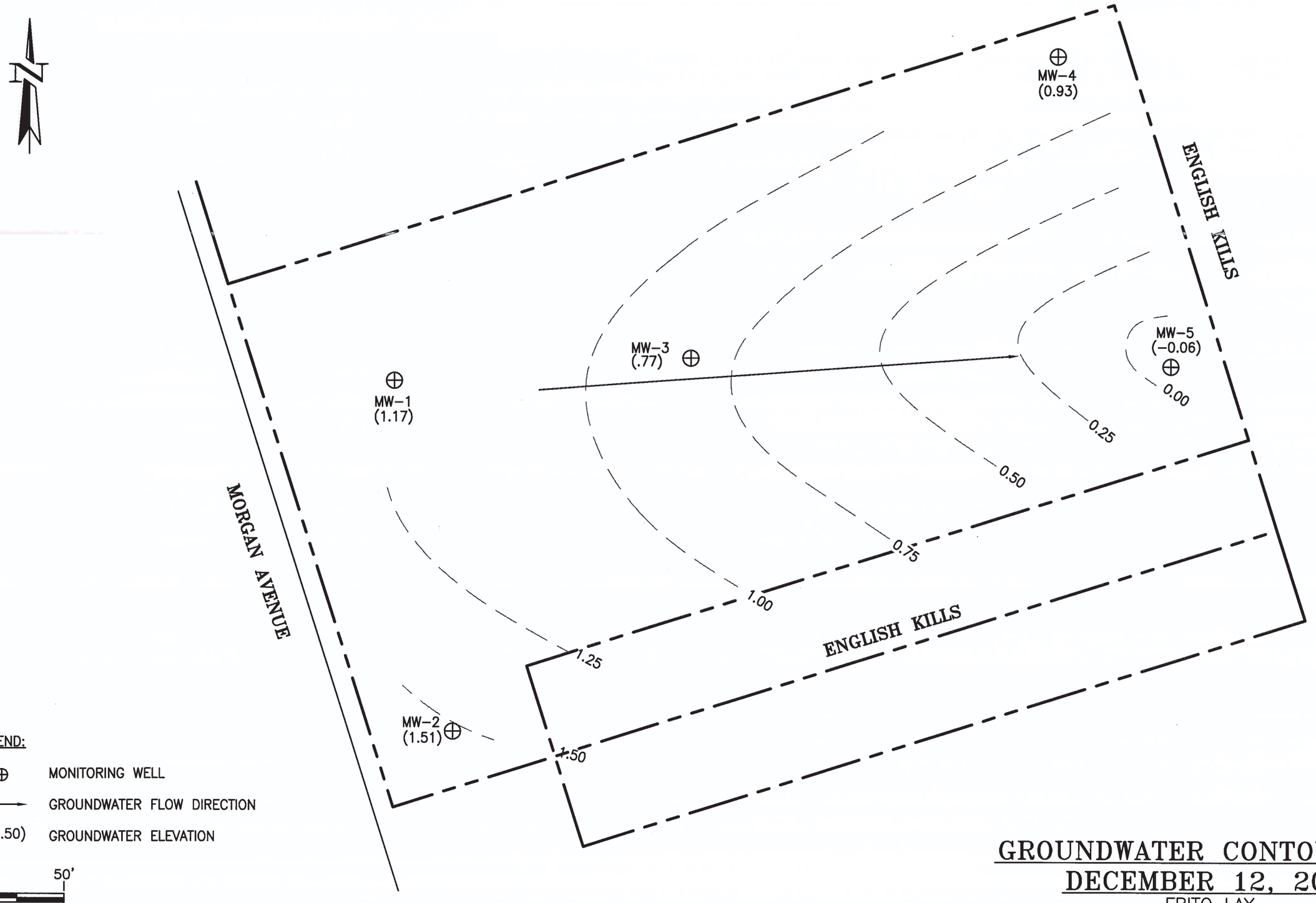
202-218 MORGAN AVENUE, BROOKLYN, NEW YORK

03/25/08 4:27pm FILE= K:\PROJECTS\47000's\47743\007\S47743-4 MW.DWG by MDOHERTY XREFs=SITE PLAN,

Attachment 4

Gannett Fleming

FIGURE 5



GROUNDWATER CONTOUR MAP
DECEMBER 12, 2007

FRITO LAY

202−218 MORGAN AVENUE, BROOKLYN, NEW YORK

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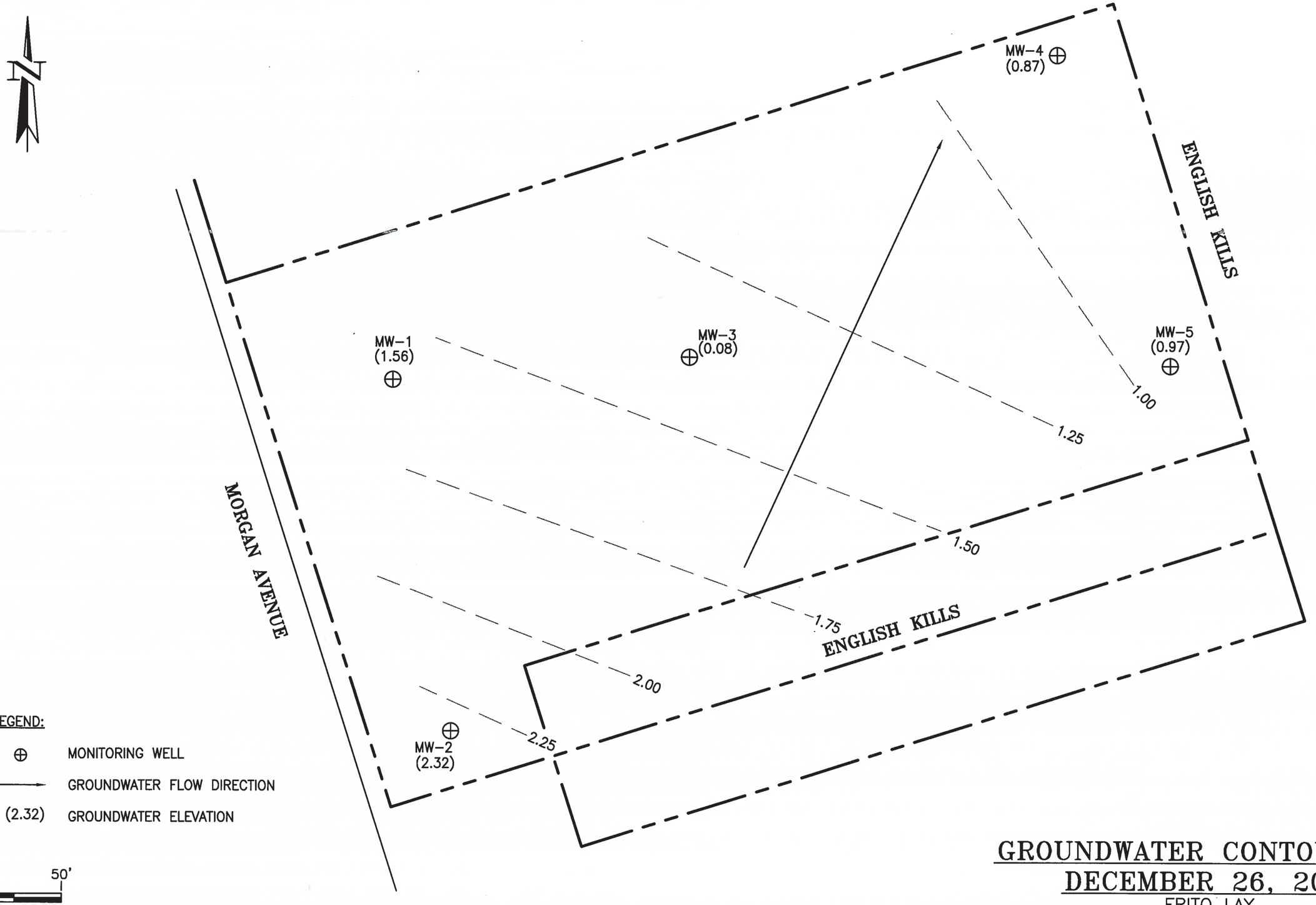
Attachment 4

Gannett Fleming

FIGURE 6



GROUNDWATER CONTOUR MAP
DECEMBER 26, 2008

FRITO LAY

202–218 MORGAN AVENUE, BROOKLYN, NEW YORK

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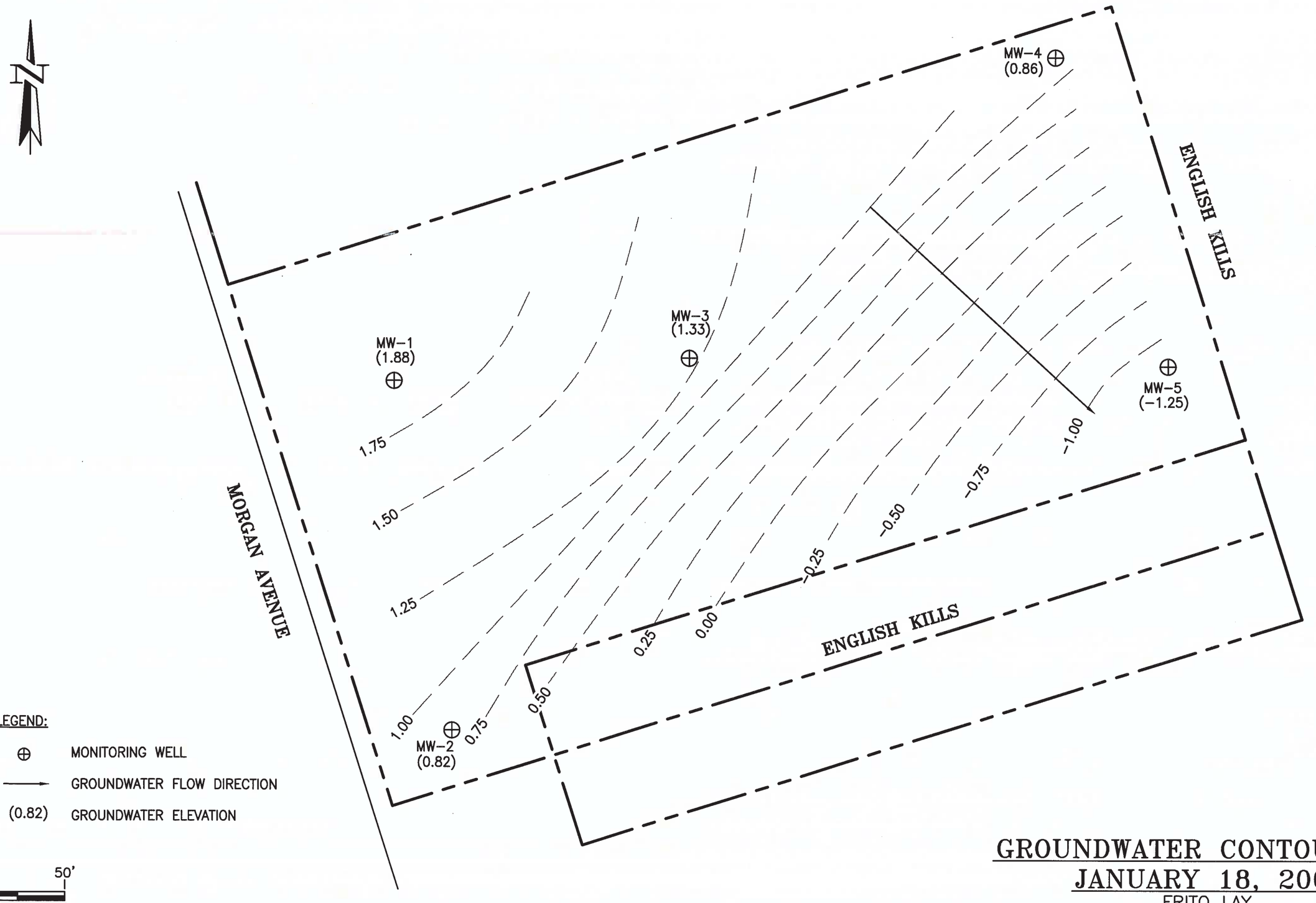
Gannett Fleming

FIGURE 7



LEGEND:

⊕ MONITORING WELL

→ GROUNDWATER FLOW DIRECTION

(0.82) GROUNDWATER ELEVATION

0 50'

Scale In Feet

GROUNDWATER CONTOUR MAP
JANUARY 18, 2008

FRITO LAY

202−218 MORGAN AVENUE, BROOKLYN, NEW YORK

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Gannett Fleming

FIGURE 4-1

LEGEND

- MONITORING WELL
- SOIL BORING LOCATION SAMPLED IN 2009
- SOIL BORING LOCATION SAMPLED IN 2007
- SEDIMENT SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATION
- SOIL GAS SAMPLE LOCATION

2007 and 2009 SAMPLING LOCATIONS

FRITO LAY, INC.

202-218 MORGAN AVENUE, BROOKLYN, NEW YORK

S:\PROJECTS\47743 - Frito Lay\Brady Files\New Figures\Site Plan\FIGURE 4-1 2007 and 2009 Sampling Locations.DWG, 2/4/2010 11:31:55 AM